

## RESEARCH ARTICLE

# Reliability and Validity of the Roberts UCLA Loneliness Scale (RULS-8) With Dutch-Speaking Adolescents in Belgium

Luc Goossens\*, Theo Klimstra†, Koen Luyckx\*, Janne Vanhalst\* and Eveline Teppers\*

The internal consistency and construct validity of the RULS-8, a brief measure of loneliness for use with adolescents, was examined in three samples of Dutch-speaking adolescents in Belgium (for a total of  $N = 6,236$ ). The measure showed high levels of internal consistency (ranging between .80 and .82), strong convergence with the original 20-item instrument ( $r = .92$ ; Sample 1;  $N = 282$ ), excellent fit with its hypothesized factor structure through confirmatory factor analysis (Sample 2;  $N = 1,144$ ), measurement invariance across gender, and significant correlations in the expected direction with a set of indicators of psychological adaptation and maladaptation (Sample 3;  $N = 4,810$ ). Based on these results, the 8-item short form is recommended for use with Dutch-speaking adolescents when administration of the full form seems less advisable due to time constraints. Suggestions for potential use of the short form and for future research on its reliability and validity are outlined.

**Keywords:** loneliness; adolescence; UCLA short form; internal consistency; construct validity.

Loneliness, defined as the negative feelings that arise when the actual quality of a person's social relationships is lower than their expected quality (Perlman & Peplau, 1981), is a problem that presents itself in various phases of the lifespan. These negative feelings are thought to be particularly pronounced during adolescence, because of

the many social changes that young people have to deal with during this period of life (Goossens, 2006). As a consequence, it is important to have solid measures of loneliness directed at this specific population. The present article examines the psychometric properties of a brief measure of loneliness, the RULS-8 (Roberts, Lewinsohn, & Seeley, 1993), as used with Dutch-speaking adolescents in Belgium.

\* School Psychology and Child and Adolescent Development, KULeuven-University of Leuven, Belgium  
[Luc.Goossens@ppw.kuleuven.be](mailto:Luc.Goossens@ppw.kuleuven.be).

† Department of Developmental and Clinical Psychology, Tilburg University, The Netherlands

Corresponding Author: Luc Goossens

## Loneliness in Adolescence

Up to 20% of all adolescents are expected to feel lonely at least some of the time (Brennan, 1982) and research on older adolescents, mostly college students, revealed that higher levels of loneliness are associated

with lower levels of psychological adaptation and greater incidence of clinical problems, including depression, anxiety, and suicide ideation (Heinrich & Gullone, 2006). Greater loneliness is also observed in adolescents with lower levels of both social adjustment (e.g., lower friendship quality; Vanhalst, Luyckx, & Goossens, *in press*) and school adaptation (e.g., who do poorly on exams; Benner, 2011). Some interventions successfully aim to change people's evaluation of their social relations and thus prevent or reduce feelings of loneliness (Masi, Chen, Hawkey, & Cacioppo, 2011). In the contexts of both research and intervention, therefore, it is important to have good measures of loneliness to identify adolescents with high levels of loneliness and to evaluate the success of programs intended to reduce loneliness.

### Measuring Loneliness

A well-established measure is the revised version of the UCLA Loneliness Scale (UCLA-R; Russell, Peplau, & Cutrona, 1980), which has been used in an estimated 80% of all empirical studies on loneliness (Oshagan & Allen, 1992). Two types of items can be found in the scale, which probe for (a) negative appraisals of one's social relationships and (b) the negative emotions, most notably the feeling of being abandoned, that accompany such appraisals (Shaver & Brennan, 1991). Initially developed as a scale that contained negative statements only, the 20-item instrument was later transformed into a balanced scale (Russell et al., 1980). Ten items probe for loneliness and 10 items ask for its counterpart, that is, social connectedness, and have to be reversed in scoring. The former items directly probe for negative appraisals of relationships (e.g., "My social relationships are superficial") or negative feelings related to them (e.g., "I feel left out"). The latter items tap into positive evaluations of one's relationships (e.g., "I feel like I am part of a group of friends") or deny negative feelings associated with social relationships (e.g., "I do not feel alone"). The instrument shows high

internal consistency (Hartshorne, 1993) and construct validity as demonstrated through correlations with measures of related constructs (Russell et al., 1980).

Exploratory factor analyses (EFA) have either supported a two-factor or a three-factor structure. The two-factor structure either reflected the negative vs. positive wording of the items (Knight, Chisholm, Marsh, & Godfrey, 1988) or contrasted negative feelings (referred to as "painful disconnection") to negative appraisals of social relationships (referred to as "lack of pleasurable engagement"; Joiner, Lewinsohn, & Seeley, 2002). These two-factor solutions are highly similar to one another, as most of the emotion-related items are negatively worded (i.e., reflecting loneliness) and most of the appraisal items are positively worded (i.e., reflecting social connectedness). The three-factor structure represented a further specification or subdivision of the two-factor structure. The first of these factors, labelled "Isolation" comprised all of the negatively phrased items (10 items; e.g., "I feel left out"), whereas the positively phrased items were split into "Lack of relational connectedness" (5 items; e.g., "There are people I can talk to", reverse coded) and "Lack of collective connectedness" (5 items; e.g., "I have a lot in common with the people around me", reverse coded; Hawkey, Browne, & Cacioppo, 2005). Confirmatory factor analysis provided support for a three-factor solution, with all items loading on a first substantive factor (labelled "Loneliness"), and with the negatively phrased and positively phrased items having additional loadings on the second and third factor, respectively (Russell, 1996).

An impediment to the widespread use of the UCLA-R in survey research, however, is its length. Several short forms have therefore been developed, that range in length between 3 items (Hughes, Waite, Hawkey, & Cacioppo, 2004) and 10 items (Russell, 1996). An interesting option among these brief versions seems to be the RULS-8 (Roberts et al., 1993), an 8-item version developed specifically for use with adolescents.

### **The Roberts Version of the UCLA Loneliness Scale (RULS-8)**

Like all of the brief versions developed, the RULS-8 shows a high degree of internal consistency and a high correlation with the original full-length version (Roberts et al., 1993). Two features, however, make it stand out as a promising candidate for a short form to be used with adolescents. First, it is the only abridged version that was developed specifically for use with this particular age group. Most of the other short forms were developed on samples of college students (e.g., Hays & DiMatteo, 1987; Wu & Yao, 2008) or adults (e.g., Oshagan & Allen, 1992). Second, the RULS-8 is a balanced scale in terms of item valence (i.e., positive vs. negative wording), whereas other brief versions comprise mostly (Hays & DiMatteo, 1987; Wu & Yao, 2008) or exclusively negatively worded items (Hughes et al., 2004; Oshagan & Allen, 1992). Exploratory factor analysis and conceptual analysis further indicate that the developers of the RULS-8 managed to preserve much of the content coverage of the full-length measure. Exploratory factor analysis yielded either a two-factor solution with 4 negatively phrased and 4 positively phrased items (Roberts et al., 1993) or a highly similar two-factor solution that opposed "Painful disconnection" (4 positively phrased items and the reversed item "I do not feel alone") to "Lack of pleasurable engagement" (3 negatively phrased items; Joiner et al., 2002, Study 1). Using the three-factor solution for the full-length version as a background (Hawkley et al., 2005), conceptual analysis reveals that 5 items tap into "Isolation", 1 into "Lack of relational connectedness" and 2 into "Lack of collective connectedness".

Construct validity of the RULS-8 was also examined by the scale developers (Roberts et al., 1993) in a systematic way through careful selection of theoretically relevant scales. As the total score reflects the negative content of the construct of loneliness, these authors argued that the measure might be expected to yield positive correlations with indicators of psychological maladaptation

(e.g., depression and anxiety) and negative correlations with indicators of psychological adaptation (e.g., self-esteem and emotional reliance). As all of these measures had been correlated with the full-length version of the UCLA Loneliness Scale - Revised in earlier work, the scale developers used these associations as reference correlation coefficients for comparison. Through simple inspection, they found a pattern of correlations with these validation measures that was highly similar to the pattern obtained for the full version (Roberts et al., 1993). In addition, the scale developers ascertained, through statistical comparison with the referent correlations, that the associations were not significantly different from the earlier estimates obtained for the full-length version (e.g., for self-esteem) and in some cases even higher (e.g., for depression and emotional reliance). In one instance only (for anxiety) was the association for the brief version significantly lower (Higbee & Roberts, 1994).

Finally, the RULS-8 yielded some systematic differences in loneliness as a function of socio-demographic characteristics and of socio-economic or cultural deprivation in particular. In both Caucasian and Hispanic adolescents, the lowest socio-economic level had the highest average score for loneliness (Roberts et al., 1993; Higbee & Roberts, 1994). In addition, Mexican-American adolescents who mostly spoke Spanish at home, or both Spanish and English, were lonelier, again on average, than their peers who spoke English only (Higbee & Roberts, 1994). No significant age differences were observed across various but admittedly restricted age ranges (i.e., ages 11 to 15; Higbee & Roberts, 1994; or ages 15 to 18; Roberts et al., 1993). Results on gender differences were inconclusive, as one study found no such differences (Roberts et al., 1993) and the other revealed that girls had higher scores than boys (Higbee & Roberts, 1994).

In sum, the RULS-8 is a useful measure for research on adolescents because of its balanced nature and comparatively broad content, its strong measurement characteristics

and careful validation strategy, and sensitivity to some socio-demographic characteristics of adolescents. However, all of these findings are based on samples from the United States and such findings may not generalize to other countries.

### The Present Study

In the present study on the Dutch adaptation of the RULS-8, we set ourselves three objectives. First, we wanted to address some gaps in current research on the validity of the RULS-8. We conducted a confirmatory rather than an exploratory factor analysis, based on earlier work on the full-length scale (Russell, 1996). In this way, we examined whether the original three-factor structure of the full-length measure, as assessed through the superior method of CFA and comprising both a substantive and two method factors, was preserved in the brief form developed. We also checked for measurement invariance across gender, as it is important to ascertain that the loneliness items are interpreted in the same way by boys and girls before researchers proceed to further comparisons of gender. Second, we checked the construct validity through a selection of indicators of psychological adaptation and maladaptation that was slightly different from the set used by the original scale developers. The validity coefficients obtained were then compared to reference correlations for the full-length version derived from earlier work. Third and finally, we adopted an overall strategy to comparisons between the brief and the full version – as regards both reliability and validity – that is inspired by an attenuation perspective that is more subtle than the “direct comparison approach” adopted by the original developers of the RULS-8. This strategy is explained in detail below.

**Construct validity indicators and reference correlations.** Three indicators of psychological maladaptation were selected from the literature, that is, a loneliness self-labelling index and measures of depressive symptoms and suicide ideation. In addition, three indicators of psychological adaptation were

selected, that is, self-esteem, life satisfaction, and positive attitude toward the future. Reference correlations derived from research on the full-length version of the loneliness instrument (i.e., the UCLA-R) were taken from the appropriate sources (i.e., Russell et al., 1980, for the self-labelling index of loneliness; Mahon, Yarcheski, Yarcheski, Cannella, & Hanks, 2006, for depressive symptoms; Joiner & Rudd, 1996, for suicidal ideation; Mahon et al., 2006, for self-esteem; and Neto & Barros, 2000, for life satisfaction and general optimism, which was considered a proxy for positive attitude about the future).

**Attenuation perspective.** Even when care is taken to preserve most of the content of the original scale, brief versions will inevitably suffer from reduced reliability and validity, a phenomenon referred to as ‘attenuation’ in psychometrics. The expected degree of reduction in reliability and validity can be estimated using equations derived from classical test theory (or ‘true score’ theory; Nunnally & Bernstein, 1994). However, scale developers rarely do so.

In their review of the literature on short-form development, Smith, McCarthy, and Anderson (2000) recommended a two-step approach. In a first step, developers of brief versions should apply the formal equations to estimate the expected level of reliability of the planned short form, based on its projected length, and the expected correlation of this projected abridged version with the full-length form. In a second step, researchers should collect empirical data and compute the actual level of internal consistency of the short form developed and the actual correlation between this short version and the full-length form. The actual estimates can substantiate the expected values derived from the equations or turn out to be lower, as these equations are based on a number of assumptions (e.g., optimal or complete preservation of the content coverage of the full-length measure in the brief form). Examination of convergent and discriminant validity, finally, again has to adopt the two-step procedure just outlined (i.e., formal

equations followed by empirical estimates). Analyses of the reliability and validity of the RULS-8 in the present study proceeded along the lines suggested by Smith et al. (2000) whenever possible.

Our instrumental predictions were three-fold. First, we expected to find good internal consistency (Cronbach's alpha .80 or above; DeVellis, 2003) and a high correlation with the full-length form ( $r > .80$ ; Hays & DiMatteo, 1987; Wilson, Cutts, Lees, Mapungwana, & Maunganidze, 1992). Some attenuation was expected to occur in both cases. Second, we expected to find through CFA that the factor structure of the original, full-length measure had been preserved and that measurement invariance held across gender. Third and finally, we expected high correlations in the expected direction with indicators of both psychological maladaptation and psychological adaptation. Again, some attenuation was expected to occur for these correlations.

## Method

### *Participants and Procedure*

Three samples of adolescents were recruited in Flanders, the Dutch-speaking part of Belgium, for the present study. Sample 1 comprised 282 adolescents (168 girls, 114 boys) aged 12 and 13 (Grades 7 and 8) from a single school in the province of Flemish Brabant. Sample 2 was composed of 1,144 adolescents (545 boys, 597 girls; gender unknown for 2 participants) ranging in age between 14 and 18 years (Grades 9 through 12) from 8 different schools in the provinces of Eastern Flanders and Limburg and the capital region of Brussels. Participants in Sample 3, finally, were 4,810 adolescents (2,425 girls and 2,375 boys) ranging in age between 12 and 18 years (Grades 7 through 12) recruited at 99 different schools from all five provinces of Flanders.

Participants in Sample 1 completed the full-length version (i.e., the 20-item version) of the UCLA-R and participants in Sample 2 filled out the short form (i.e., the 8-item version) of the same instrument. Participants in Sample 3 completed that same brief measure

of loneliness and a set of additional measures intended to ascertain the construct validity of the loneliness instrument. All of the participants completed all instrumentation during regularly scheduled classes. In Samples 1 and 2, parents were provided with written information about the research and were asked for their consent for the adolescent to participate. Only three adolescents in Sample 1 did not receive such parental permission. In all three samples, all adolescents gave informed consent prior to their participation in the study. All adolescents were assured that the information gathered would be treated confidentially and told that they could discontinue their participation in the study at any time. None of the participants opted to do so.

### *Measures*

All measures used were in Dutch, the native language of the participants, and had been translated in earlier work from English into Dutch following the procedures outlined by the International Test Commission (Hambleton, 1994).

**Loneliness – Short form.** The RULS-8 (Roberts et al., 1993) comprises 8 items scored, in its Dutch adaptation, on a 5-point scale ranging from 1 (*completely disagree*) to 5 (*completely agree*). Sample items include "I lack companionship" and "I feel part of a group of friends" (reverse coded). A copy of the Dutch version can be found in the Appendix.

**Loneliness – Full-length form.** The UCLA-R (Russell et al., 1980) comprises 20 items scored, in its Dutch adaptation, on the same 5-point scale ranging from 1 (*completely disagree*) to 5 (*completely agree*). Internal consistency for the original North-American version of the measure, as used with college students, was .94 (Russell et al., 1980). Internal consistency in the present study on Sample 1 on high school students was somewhat lower, but still high (Cronbach's alpha = .88).

**Indicators of psychological maladaptation.** The loneliness self-labelling index comprised just a single item (i.e., "I feel

lonely”), to be responded to on a 5-point scale ranging from 1 (*completely disagree*) to 5 (*completely agree*). This type of measure is frequently used in loneliness research and in sociological studies in particular (Stack, 1998). It may be added here that there is no item that uses the terms “lonely” or “loneliness” in the UCLA Loneliness Scale-Revised (Russell et al., 1980).

Depressive symptoms were probed by means of a brief, 12-item version (Roberts & Sobhan, 1992) of the Center for Epidemiologic Studies - Depression Scale (CES-D; Radloff, 1977). This scale was translated into Dutch by Hooge, Decaluwé, and Goossens (2000). All items (e.g., “During the last week, I felt depressed”) had to be answered on a 4-point scale, ranging from 1 (*seldom or never*) to 4 (*most of the time or always*). Adequate internal consistency and construct validity of the original version have been demonstrated in samples of adolescents (Radloff, 1991) and the brief version correlated highly ( $r = .96$ ) with the full version in earlier work (Roberts & Sobhan, 1992). Cronbach’s alpha in Sample 3 was .83.

Suicidal ideation was measured by means of a single item (i.e., “Have you ever thought, during the past 12 months, to step out of this life, to call an end to it yourself?”), to be responded to on a 4-point scale, ranging from 1 (*never*) to 4 (*very often*). This type of measure is frequently used in suicide research with adolescents (Perkins & Hartless, 2002).

**Indicators of psychological adaptation.** Self-esteem was probed by the Dutch adaptation (Van der Linden & Dijkman, 1989) of the 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965). All items (e.g., “On the whole, I am satisfied with myself”) were responded to on a 4-point scale, ranging from 1 (*does not suit me well*) to 4 (*suits me well*). Internal consistency and construct validity of this Dutch adaptation, as evidenced through correlations with measures of related constructs, were demonstrated in earlier work in the Netherlands (Van der Linden & Dijkman, 1989) and the Dutch-speaking part

of Belgium (Hooge et al., 2000). Cronbach’s alpha in Sample 3 was .84.

Life satisfaction was measured by means of a single-item instrument, the Cantril ladder (Cantril, 1965). The item invited the participants to indicate their overall feeling of well-being on an 11-point scale, ranging from 0 (*very bad*) through 10 (*very good*). This measure is often used as a global assessment of quality of life and has a high test-retest reliability over a two-week period ( $r > .80$ ; Hansson, Svensson, & Björkman, 1998).

Finally, positive attitudes toward the future were assessed using the Time Attitude Scale (Nuttin & Lens, 1985). The 6 bipolar items in this scale (e.g., “I see my future as very difficult vs. very easy”) were responded to on a 5-point scale ranging from 1 (*completely disagree*) to 5 (*completely agree*). Adequate internal consistency and construct validity for this measure was demonstrated in earlier work (Nuttin & Lens, 1985). Cronbach’s alpha in Sample 3 was .84.

## Results

### Reliability

Based on the Spearman-Brown formula (Nunnally & Bernstein, 1994) and the internal consistency estimate of the full-length form (Cronbach’s alpha = .94; Russell et al., 1980), the internal consistency of the short form could be expected to reach  $8/20 \times (.94)/1 + (8/20 - 1) \times (.94) = .86$ . The empirical estimates obtained across the three samples approximated that expected value, with Cronbach’s alpha reaching .80, .80, and .82 for Samples 1, 2, and 3, respectively. These estimates do suggest some attenuation of reliability compared to the full-length version but generally reflect good reliability.

### Convergence With the Full-Length Form

Based on the internal consistency estimate of the full-length form, and the internal consistency estimate of the short form as derived from the largest sample (i.e., Sample 3; alpha = .82), the correlation between the short and the full-length form could be estimated



to reach the square root of  $(.94 \times .82)$  or  $r = .88$ . The empirical estimate obtained on Sample 1 reached  $r = .92$ , which indicated a high degree of convergence with the original, 20-item version of the UCLA Loneliness Scale-Revised.

### **Confirmatory Factor Analysis (CFA)**

CFA was conducted on Sample 2 and compared the empirical fit with three hypothesized factor structures. The first of these structures represented a one-factor solution with all items forced to load on a single loneliness factor. The second one was a two-factor solution with the negatively phrased items (i.e., Items 2, 5, 6, and 7) loading on the first factor and the positively phrased items (i.e., Items 1, 3, 4, and 8) on the second one. The third structure, finally, was a three-factor solution with one substantive factor (i.e., loneliness) and two method factors that referred to item valence (i.e., negative vs. positive wording). In this solution, all 8 items loaded on Factor 1, all negatively phrased items (i.e., Items 2, 5, 6, and 7) had an additional high loading on Factor 2, and all positively phrased items (i.e., Items 1, 3, 4, and 8) had an additional high loading on Factor 3. This three-factor solution was the one which was expected to provide the best fit to the data based on earlier CFA work (Russell, 1996).

Statistical fit was evaluated using the normed chi-square (i.e., chi-square divided by the degrees of freedom), which should be below 2, the Comparative Fit Index (CFI), which should exceed .95, the Root Mean Square Error of Approximation (RMSEA), which should be smaller than .06, and the Standardized Root Mean Square Residual (SRMR), which should be smaller than .08 (Hu & Bentler, 1999). Fit indices are represented in **Table 1**. As expected, the three-factor solution provided excellent fit to the data with all requirements met for all four fit indices specified. Factor loadings of the three-factor solution are presented in **Table 2**.

### **Measurement Invariance Across Gender**

Next, we tested for three types of measurement invariance across gender. First, we tested for configural invariance to examine whether the model obtained in the whole sample also fitted well for boys and girls, separately. This was indeed the case, as this model also fitted well for both boys ( $X^2(11) = 13.825$  (n.s.), CFI = .996; RMSEA = .022) and girls ( $X^2(11) = 28.287$  ( $p < .01$ ), CFI = .980; RMSEA = .051). These models cannot be compared to one another, as they are non-nested. Further, tests for configural invariance merely indicate that the number of factors and the pattern of factor loadings is roughly equivalent for different groups (i.e., boys and girls; Vandenberg & Lance, 2000).

To test for full measurement invariance, two additional steps have been recommended. First, metric invariance tests are run to examine whether constraining factor loadings to be equal across groups affects model fit. Second, scalar invariance is tested by examining whether model fit is affected by constraining intercepts of latent factor indicators (i.e., items) to be equal across groups (Vandenberg & Lance, 2000). Together, metric and scalar invariance tests are useful when checking for systematic response bias. Similar to Nye, Roberts, Saucier, and Zhou (2008), we examined metric and scalar invariance in a single step. Model comparisons indicated that a model in which factor loadings and item intercepts were constrained to be equal for boys and girls ( $X^2(39) = 55.409$  ( $p < .05$ ), CFI = .990; RMSEA = .027) fitted just as well as a model in which these parameters were allowed to vary for boys and girls ( $X^2(25) = 43.963$  ( $p < .05$ ), CFI = .988, RMSEA = .036). That is, a chi-square difference test (Satorra & Bentler, 2001) was non-significant ( $p > .05$ ), differences in CFI were smaller than .010 (Cheung & Rensvold, 2002), and differences in RMSEA were smaller than .015 (Chen, 2007). Thus, we established full measurement invariance across gender.

Model	$\chi^2$	df	NX <sup>2</sup>	CFI	RMSEA	SRMR
One factor (i.e., loneliness)	189.868***	20	9.49	.891	.086	.043
Two factors (i.e., positive/negative)	106.829***	19	5.62	.944	.064	.039
Three factors (i.e., loneliness, positive, negative)	14.664	11	1.33	.998	.017	.013

*Note.* NX<sup>2</sup> = Normed chi-square; CFI = Comparative fit index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual. *N* = 1,144. \*\*\* *p* < .001.

**Table 1:** Confirmatory Factor Analysis: Fit Indices (Sample 2)

Item	Global factor	Negative items (lonely)	Positive items (not lonely)
1	.39 <sup>a</sup>	XX	.52 <sup>a</sup>
2	.70***	.02	XX
3	.63***	eXX	.24 <sup>*</sup>
4	.41***	XX	.70***
5	.38***	.21 <sup>a</sup>	XX
6	.49***	.70***	XX
7	.50***	.62***	XX
8	.34***	XX	.62***

*Note.* Items with superscript <sup>a</sup> are reference items within their factor. Therefore, their standard error is constrained to zero by default. As a result, their significance level cannot be determined. Correlations of the global factor with the method factors (i.e., negative vs. positive items) were constrained to zero. The correlation between the two method factors was not significant. Reverse coded items were recoded before the analyses. \* *p* < .05. \*\*\* *p* < .001.

**Table 2:** Factor Loadings of the Three-Factor Solution (Sample 2)

**Construct Validity**

Correlations with indicators of psychological maladaptation and psychological adaptation, as obtained on Sample 3, are represented in **Table 3**. The first column of this table represents estimated correlations with these indicators for the full-length version, as gleaned from the sources detailed in the Introduction section. The second column represents estimated attenuated correlations for the short form. The expected correlation of *r* = .70 with a loneliness self-labelling index for the full-length form, for instance, translates into an

expected attenuated value of (.70) \* (.82)<sup>1/2</sup> / (.94)<sup>1/2</sup> or *r* = .65 for the short form. The third column, finally, represents the empirical correlations for the short form obtained on Sample 3.

With just two exceptions, the empirical correlations in Column 3 closely approximated the original associations for the full-length form in Column 1. For suicidal ideation and life satisfaction, both of which were measured by means of a single-item measure, the estimates obtained were more in line with the expected attenuated values in Column



Scale/Measure	<i>N</i> <sub>items</sub>	(1) Original correla- tion (20 items)	(2) Inferred attenu- ated correlation (8 items)	(3) Observed correla- tion (8 items)
Indicators of maladaptation				
Loneliness self-labelling index	1	.70	.65	.68
Depressive symptoms	12	.55	.52	.53
Suicidal ideation	1	.35	.32	.26
Indicators of adaptation				
Self-esteem	10	-.49	-.46	-.51
Life satisfaction	1	-.53	-.50	-.47
Positive attitude towards future	6	-.36	-.34	-.35

*Note.* All correlations are significant at  $p < .001$ . *N*s range between 4,266 and 4,551.

**Table 3:** Construct Validity: Correlations With Indicators of Psychological Adaptation and Maladaptation (Sample 3)

2. The Pearson correlation between Columns 1 and 3, a convenient and informative index of construct validity (Westen & Rosenthal, 2003), reached  $r = .97$ . It seems safe to conclude, therefore, that attenuation of validity coefficients due to the shortening of the loneliness measure seems minimal, except for single-item indicators, and that there is a high degree of convergence between the pattern of correlations produced between the original 20-item version and six validation variables and the pattern of correlations with these same six variables obtained for the 8-item version.

**Discussion**

The present study was the first to explore the psychometric properties of the RULS-8 with Dutch-speaking adolescents in Belgium, and the validation effort based on the largest samples so far worldwide (based on a combined sample size of  $N = 6,236$ ). The findings have important implications for psychologists who want to use the instrument with the intended target population. Some comments, however, can be made on the approach adopted and additional aspects of the reliability and validity

of the short form will have to be addressed in future research.

**Reliability and Validity of the Short Form**

The reliability and construct validity of the RULS-8, as used with Dutch-speaking adolescents in Belgium, were clearly demonstrated in the present article. In line with expectations, the measure showed high levels of internal consistency across three samples (all Cronbach alphas .80 or higher), strong convergence with the original 20-item instrument ( $r > .90$ ), excellent fit with its hypothesized three-factor structure, measurement invariance across gender, and significant correlations in the expected direction with a set of indicators of psychological adaptation and maladaptation. These empirical estimates were in line with the expected degree of attenuation for an 8-item version and even approximated earlier estimates for the full-length form.

**Limitations of the Present Study**

It is important to realize that the results of the present article, while encouraging, are dependent on a set of basic assumptions in

classical test theory and some reference values obtained in research with the original 20-item version of the instrument. The Cronbach alpha value of .94 for the full-length form, for instance, is based on the original work that the scale developers conducted with college students. Subsequent research suggested this could be an overestimation, because a meta-analysis estimated this value to be .87 across a set of 80 studies (Vassar & Crosby, 2008). To the extent that the value used represents an overestimate, the expected degree of attenuation may be less pronounced than assumed in the present analyses.

In some cases did we compute empirical estimates on a non-independent sample, as defined by Smith et al. (2000) (i.e., a sample in which all 20 items of the UCLA-R were administered). The estimate of internal consistency for the short form derived on Sample 1, therefore, may represent an overestimation, though it was in line with the other estimates obtained on independent samples. Likewise, the correlation between the short and full-length forms, again computed on Sample 1 and based on an administration of the full, 20-item form, most likely represents an inflated value. Smith et al. (2000) recommended that the two forms (i.e., short and long) be administered separately to the same sample at a single occasion to estimate this correlation, with proper measures in place (e.g., appropriate instructions or filler items). Nobody, however, seems to have headed that call as of yet.

Some caveats are in order with regard to the validity work conducted on Sample 3. First, some of the validity indicators used with that sample differed in length or content from the measures used in earlier work with the full-length form. The measures of suicidal ideation and life satisfaction were single-item indicators, whereas earlier work with the full UCLA-R used multi-item measures of these constructs (Joiner & Rudd, 1996; Neto & Barros, 2000). In addition, general optimism (Neto & Barros, 2000) can only be a rough approximation of positive attitude

toward the future, as measured in Sample 3. Second, the overall index of construct validity is an “alerting” correlation, because it is a rough, readily interpretable index that can alert researchers to possible trends of interest (Westen & Rosenthal, 2003).

Another caveat is that the current findings were obtained on Dutch-speaking adolescents in Belgium. These results, therefore, may not generalize to other age groups or linguistic groups in that particular country or to adolescents in other parts of the world. The age range covered within the period of adolescence across the three samples in the present study (i.e., 12 to 18 years) is also considerable. Age differences in loneliness have not been analyzed in depth in the present study which focused exclusively on psychometric issues. Finally, differences in socio-economic status and ethnicity, which have received some attention in earlier research, have not been explored in this study either.

### ***Suggestions for Future Research and Practical Implications***

Future research could assess aspects of reliability and validity not covered in the present study. As regards reliability, test-retest estimates over a period of weeks could be obtained. Such estimates currently are not available for the RULS-8. Stability estimates across a one-year period proved encouraging for this particular aspect of reliability (Roberts et al., 1993). As brief measures of loneliness such as the RULS-8 may also be used in diary studies, the reliability of change scores obtained in such research designs may also be examined (Cranford, Shrout, Iida, Rafaeli, Yip, & Bolger, 2006). As regards validity, researchers may extend the range of validity indicators used to conduct more audacious studies of construct validity.

Pending such research, the 8-item short form of the UCLA Loneliness Scale – Revised, as developed by Roberts et al. (1993), is recommended for use with Dutch-speaking adolescents in Belgium when administration of

the full form seems less advisable due to time constraints, as is the case in large-scale survey studies that tap into multiple constructs. One interesting way to use the brief version, which would be in line with its somewhat restricted content, would be to use it as a screening device (or so-called “first line” assessment). In the case of critically high loneliness scores, more extensive measures can be administered (in a so-called “second line” assessment). The latter measures may include semi-structured interviews (such as the Friendship and Peer Relations Interview; Zimmermann, 2004) or multidimensional measures of loneliness (such as the Loneliness and Aloneness Scale for Children and Adolescents; Marcoen, Goossens, & Caes, 1987).

**Appendix**  
**The Roberts UCLA Loneliness Scale**  
**(RULS-8) – Dutch version**

**My Social Relationships**

**Instructions:**

Hieronder staan een aantal uitspaken over jezelf en je relaties. Geef voor iedere uitspraak aan hoe juist ze voor jou is. Omcirkel het passende antwoord.

- 1

Helemaal onjuist
- 2

Eerder onjuist
- 3

Noch juist, noch onjuist
- 4

Eerder juist
- 5

Helemaal juist
1.

Ik heb het gevoel dat ik goed kan opschieten met de mensen in mijn omgeving. (R)

1

2

3

4

5
2.

Ik mis gezelschap.

1

2

3

4

5
3.

Ik voel me niet alleen. (R)

1

2

3

4

5
4.

Ik heb het gevoel dat ik tot een groep van vrienden behoor. (R)

- 1

2

3

4

5
5.

Ik voel me met niemand meer nauw verbonden.

1

2

3

4

5
6.

Ik voel me uitgesloten.

1

2

3

4

5
7.

Ik voel me geïsoleerd van anderen.

1

2

3

4

5
8.

Ik kan gezelschap vinden, wanneer ik dat wil. (R)

1

2

3

4

5

*Note.* R indicates that scoring has to be reversed.

**References**

**Benner, A. D.** (2011). Latino adolescents' loneliness, academic performance, and the buffering role of friendships. *Journal of Youth and Adolescence*, 40, 556–567. DOI: <http://dx.doi.org/10.1007/s10964-010-9561-2>

**Brennan, T.** (1982). Loneliness at adolescence. In L.A. Peplau & D. Perlman (Eds.), *Loneliness: A sourcebook of current theory, research, and therapy* (pp. 269–290). New York: Wiley Interscience.

**Cantril, H.** (1965). *The pattern of human concerns*. New Brunswick, NJ: Rutgers University.

**Chen, F. F.** (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling*, 14, 464–504. DOI: <http://dx.doi.org/10.1080/10705510701301834>

**Cheung, G. W., & Rensvold, R. B.** (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling*, 9, 233–255. DOI: [http://dx.doi.org/10.1207/S15328007SEM0902\\_5](http://dx.doi.org/10.1207/S15328007SEM0902_5)

**Cranford, J. A., Shrout, P. E., Jida, M., Rafaeli, E., Yip, T., & Bolger, N.** (2006). A procedure for evaluating sensitivity to within-person change: Can mood meas-

- ures in diary studies detect changes reliably? *Personality and Social Psychology Bulletin*, 32, 917–929. DOI: <http://dx.doi.org/10.1177/0146167206287721>
- DeVellis, R. F.** (2003). *Scale development: Theory and applications* (2nd ed.). Thousand Oaks, CA: Sage.
- Goossens, L.** (2006). Affect, emotion, and loneliness in adolescence. In S. Jackson & L. Goossens (Eds.), *Handbook of adolescent development* (pp. 51–70). Hove, UK: Psychology Press.
- Hambleton, R. K.** (1994). Guidelines for adapting educational and psychological tests: A progress report. *European Journal of Psychological Assessment*, 10, 229–244.
- Hansson, L., Svensson, B., & Björkman, T.** (1998). Quality of life of the mentally ill: Reliability of the Swedish version of the Lancashire Quality of Life Profile. *European Psychiatry*, 13, 231–234. DOI: [http://dx.doi.org/10.1016/S0924-9338\(98\)80010-2](http://dx.doi.org/10.1016/S0924-9338(98)80010-2)
- Hartshorne, T. S.** (1993). Psychometric properties and confirmatory factor analysis of the UCLA Loneliness Scale. *Journal of Personality Assessment*, 61, 182–195. DOI: [http://dx.doi.org/10.1207/s15327752jpa6101\\_14](http://dx.doi.org/10.1207/s15327752jpa6101_14)
- Hawkley, L. C., Browne, M. W., & Cacioppo, J. T.** (2005). How can I connect with thee? Let me count the ways. *Psychological Science*, 16, 798–804. DOI: <http://dx.doi.org/10.1111/j.1467-9280.2005.01617.x>
- Hays, R. D., & DiMatteo, M. R.** (1987). A short-form measure of loneliness. *Journal of Personality Assessment*, 51, 69–81. DOI: [http://dx.doi.org/10.1207/s15327752jpa5101\\_6](http://dx.doi.org/10.1207/s15327752jpa5101_6)
- Heinrich, L. M., & Gullone, E.** (2006). The clinical significance of loneliness: A literature review. *Clinical Psychology Review*, 26, 695–718. DOI: <http://dx.doi.org/10.1016/j.cpr.2006.04.002>
- Higbee, K. R., & Roberts, R. E.** (1994). Reliability and validity of a brief measure of loneliness with Anglo-American and Mexican-American adolescents. *Hispanic Journal of Behavioral Sciences*, 16, 459–474. DOI: <http://dx.doi.org/10.1177/07399863940164005>
- Hooge, J., Decaluwé, L., & Goossens, L.** (2000). Identiteit en psychisch welbevinden [Identity and psychological well-being]. In H. De Witte, J. Hooge, & L. Walgrave (Eds.), *Jongeren in Vlaanderen: Gemeten en geteld* (pp. 35–57). Leuven, Belgium: Universitaire Pers Leuven.
- Hu, L., & Bentler, P. M.** (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1–55. DOI: <http://dx.doi.org/10.1080/10705519909540118>
- Hughes, M. E., Waite, L. J., Hawkey, L. C., & Cacioppo, J. T.** (2004). A short scale for measuring loneliness in large surveys: Results from two population studies. *Research on Aging*, 26, 655–672. DOI: <http://dx.doi.org/10.1177/0164027504268574>
- Joiner, T. E., Lewinsohn, P. M., & Seeley, J. R.** (2002). The core of loneliness: Lack of pleasurable engagement – more so than painful disconnection – predicts social impairment, depression onset, and recovery from depressive disorders among adolescents. *Journal of Personality Assessment*, 79, 472–491. DOI: [http://dx.doi.org/10.1207/S15327752JPA7903\\_05](http://dx.doi.org/10.1207/S15327752JPA7903_05)
- Joiner, T. E., & Rudd, M. D.** (1996). Disentangling the interrelations between hopelessness, loneliness, and suicidal ideation. *Suicide and Life-Threatening Behavior*, 26, 19–26.
- Knight, R. G., Chisholm, B. J., Marsh, N. V., & Godfrey, H. P. D.** (1988). Some normative, reliability, and factor analytic data for the Revised UCLA Loneliness Scale. *Journal of Clinical Psychology*, 44, 203–206. DOI: [http://dx.doi.org/10.1002/1097-4679\(198803\)44:2<203::AID-JCLP2270440218>3.0.CO;2-5](http://dx.doi.org/10.1002/1097-4679(198803)44:2<203::AID-JCLP2270440218>3.0.CO;2-5)
- Mahon, N. E., Yarcheski, A., Yarcheski, T. J., Cannella, B. L., & Hanks, M. M.** (2006). A meta-analytic study of predictors for loneliness during adolescence. *Nursing Research*, 55, 308–315. DOI:

- <http://dx.doi.org/10.1097/00006199-200609000-00003>
- Marcoen, A., Goossens, L., & Caes, P.** (1987). Loneliness in pre- through late adolescence: Exploring the contributions of a multidimensional approach. *Journal of Youth and Adolescence*, 16, 561–577. DOI: <http://dx.doi.org/10.1007/BF02138821>
- Masi, C. H., Chen, C. H., Hawkey, L. C., & Cacioppo, J. T.** (2011). A meta-analysis of interventions to reduce loneliness. *Personality and Social Psychology Review*, 15, 219–266. DOI: <http://dx.doi.org/10.1177/1088868310377394>
- Neto, F., & Barros, J.** (2000). Psychosocial concomitants of loneliness among students of Cape Verde and Portugal. *Journal of Psychology*, 134, 503–514. DOI: <http://dx.doi.org/10.1080/00223980009598232>
- Nunnally, J. C., & Bernstein, I. H.** (1994). *Psychometric theory* (3rd ed.). New York: McGraw Hill.
- Nuttin, J., & Lens, W.** (1985). *Future time perspective and motivation: Theory and research methods*. Hillsdale, NJ: Erlbaum.
- Nye, C. D., Roberts, B. W., Saucier, G., & Zhou, X.** (2008). Testing the measurement equivalence of personality adjective items across cultures. *Journal of Research in Personality*, 42, 1524–1536. DOI: <http://dx.doi.org/10.1016/j.jrp.2008.07.004>
- Oshagan, H., & Allen, R. L.** (1992). Three loneliness scales: An assessment of their measurement properties. *Journal of Personality Assessment*, 59, 380–409. DOI: [http://dx.doi.org/10.1207/s15327752jpa5902\\_13](http://dx.doi.org/10.1207/s15327752jpa5902_13)
- Perkins, D. F., & Hartless, G.** (2002). An ecological risk-factor examination of suicide ideation and behavior of adolescents. *Journal of Adolescent Research*, 17, 3–26. DOI: <http://dx.doi.org/10.1177/0743558402171001>
- Perlman, D., & Peplau, L. A.** (1981). Toward a social psychology of loneliness. In R. Gilmour & S. Duck (Eds.), *Personal relationships: 3. Relationships in disorder* (pp. 31–56). London: Academic Press.
- Radloff, L. S.** (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385–401. DOI: <http://dx.doi.org/10.1177/014662167700100306>
- Radloff, L. S.** (1991). The use of the Center for Epidemiologic Studies Depression scale in adolescents and young adults. *Journal of Youth and Adolescence*, 20, 149–166. DOI: <http://dx.doi.org/10.1007/BF01537606>
- Roberts, R. E., Lewinsohn, P. M., & Seeley, J. R.** (1993). A brief measure of loneliness suitable for use with adolescents. *Psychological Reports*, 72, 1379–1391. DOI: <http://dx.doi.org/10.2466/pr0.1993.72.3c.1379>
- Roberts, R. E., & Sobhan, M.** (1992). Symptoms of depression in adolescence: A comparison of Anglo, African, and Hispanic Americans. *Journal of Youth and Adolescence*, 21, 639–651. DOI: <http://dx.doi.org/10.1007/BF01538736>
- Rosenberg, M.** (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Russell, D. W.** (1996). UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure. *Journal of Personality Assessment*, 66, 20–40. DOI: [http://dx.doi.org/10.1207/s15327752jpa6601\\_2](http://dx.doi.org/10.1207/s15327752jpa6601_2)
- Russell, D., Peplau, L. A., & Cutrona, C. E.** (1980). The revised UCLA Loneliness Scale: Concurrent and discriminant validity evidence. *Journal of Personality and Social Psychology*, 39, 472–480. DOI: <http://dx.doi.org/10.1037/0022-3514.39.3.472>
- Satorra, A., & Bentler, P. M.** (2001). A scaled difference chi-square test statistic for moment structure analysis. *Psychometrika*, 66, 507–514. DOI: <http://dx.doi.org/10.1007/BF02296192>
- Shaver, P. R., & Brennan, K. A.** (1991). Measures of depression and loneliness. In J. P. Robinson, P. R. Shaver, & L. S. Wrightsman (Eds.), *Measures of personality and social psychological attitudes* (pp. 195–289). San Diego, CA: Academic Press.



- Smith, G. T., McCarthy, D. M., & Anderson, K. G.** (2000). On the sins of short-form development. *Psychological Assessment, 12*, 102–111. DOI: <http://dx.doi.org/10.1037/1040-3590.12.1.102>
- Stack, S.** (1998). Marriage, family and loneliness: A cross-national study. *Sociological Perspectives, 41*, 415–432. DOI: <http://dx.doi.org/10.2307/1389484>
- Vandenberg, R. J., & Lance, C. E.** (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods, 3*, 4–70. DOI: <http://dx.doi.org/10.1177/109442810031002>
- Van der Linden, F. J., & Dijkman, T. A.** (1989). *Jong zijn en volwassen worden in Nederland. Een onderzoek naar het psychosociaal functioneren in alledaagse situaties van de Nederlandse jongeren tussen 12 en 21 jaar* [Being young and growing up in the Netherlands]. Nijmegen, The Netherlands: Hoogveld Institute.
- Vanhalst, J., Luyckx, K., & Goossens, L.** (in press). Experiencing loneliness in adolescence: A matter of personal characteristics, negative peer experiences, or both? *Social Development*. Advance online publication. doi: 10.1111/sode.12019
- Vassar, M., & Crosby, J. W.** (2008). A reliability generalization study of coefficient alpha for the UCLA Loneliness scale. *Journal of Personality Assessment, 90*, 601–607. DOI: <http://dx.doi.org/10.1080/00223890802388624>
- Westen, D., & Rosenthal, R.** (2003). Quantifying construct validity: Two simple measures. *Journal of Personality and Social Psychology, 84*, 608–618. DOI: <http://dx.doi.org/10.1037/0022-3514.84.3.608>
- Wilson, D., Cutts, J., Lees, I., Mapungwana, S., & Maunganidze, L.** (1992). Psychometric properties of the Revised UCLA Loneliness Scale and two short-form measures of loneliness in Zimbabwe. *Journal of Personality Assessment, 59*, 72–81. DOI: [http://dx.doi.org/10.1207/s15327752jpa5901\\_7](http://dx.doi.org/10.1207/s15327752jpa5901_7)
- Wu, C. H., & Yao, G.** (2008). Psychometric analysis of the short-form UCLA Loneliness Scale (ULS-8) in Taiwanese undergraduate students. *Personality and Individual Differences, 44*, 1762–1771. DOI: <http://dx.doi.org/10.1016/j.paid.2008.02.003>
- Zimmermann, P.** (2004). Attachment representations and characteristics of friendship relations during adolescence. *Journal of Experimental Child Psychology, 88*, 83–101. DOI: <http://dx.doi.org/10.1016/j.jecp.2004.02.002>

**How to cite this article:** Goossens, L et al. (2014). Reliability and Validity of the Roberts UCLA Loneliness Scale (RULS-8) With Dutch-Speaking Adolescents in Belgium. *Psychologica Belgica* 54(1), 5-18, DOI: <http://dx.doi.org/10.5334/pb.ae>

**Submitted:** 19 March 2013 **Accepted:** 10 July 2013 **Published:** 20 January 2014

**Copyright:** © 2014 The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution 3.0 Unported License (CC-BY 3.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. See <http://creativecommons.org/licenses/by/3.0/>.

**ju** *Psychologica Belgica* is a peer-reviewed open access journal published by Ubiquity Press

**OPEN ACCESS** 